

Claim

1. A display method for displaying three-dimensional data as a combination of three sectional images of an X-section, a Y-section, and a Z-section orthogonalizing each other, by processing a three-dimensional data obtained by such as CT imaging, said method comprising the steps of;

preparing in advance sectional images of sections parallel to said X-section, Y-section, and Z-section, said sectional images being sliced off data from said three-dimensional data at a predetermined interval,

displaying on three display parts as a three sectional displaying mode a X-sectional image, a Y-sectional image, and a Z-sectional image, each selected from said prepared sectional images, together with an X-cursor, a Y-cursor, and a Z-cursor, each of which specifies a section of said corresponding sectional images, and

when, on any one of said three display parts, at least one of said cursors displayed together with said sectional images is moved, sequentially changing a sectional image to be displayed corresponding to the moved cursor on another display part different from the display part where the cursor was moved, following the moving of the cursor, in a manner that said sectional image to be displayed on said other display part is selected from said sectional images.

2. The display method as set forth in claim 1,

wherein, a uvw coordination system defined by U-section, V-section and W-section is newly defined as a rotated

coordination system relative to a xyz coordination system defined by said X-section, said Y-section and said Z-section, and wherein said method comprising the steps of; preparing in advance sectional images of sections parallel to said U-section, V-section, and W-section, said sectional images being sliced off data from said three-dimensional data at a predetermined interval,

displaying on three display parts as a three sectional displaying mode a U-sectional image, a V-sectional image, and a W-sectional image, each selected from said prepared sectional images, together with an U-cursor, a V-cursor, and a W-cursor, each of which specifies a section of said corresponding sectional images, and

when, on any one of said three display parts, at least one of said cursors displayed together with said sectional images is moved, sequentially changing a sectional image to be displayed corresponding to the moved cursor on another display part different from the display part where the cursor was moved, following the moving of the cursor, in a manner that said sectional image to be displayed on said other display part is selected from said sectional images.

3. The display method as set forth in claim 2,

wherein presetting of a rotational angle for said uvw coordinate system is executed by doing a specified operation on any one of display parts displaying the X-, Y-, and Z-sectional images.

4. The display method as set forth in any one of claims 1 - 3, wherein said three sectional images are displayed as combination of three sectional images, like as a form of three-section picture display of a three-dimensional body.

5. The display method as set forth in any one of claims 1 - 3 wherein said cursors are displayed on said three display parts as a combination of two cursors crossing each other, and wherein, when a crossing point of said two cursors is transversely moved on any one of said display parts, sequentially changing sectional images to be displayed corresponding to said moved cursors by moving of the crossing point on other display parts different from the display part where the cursor was moved, following the moving of the cursors, in a manner that said sectional image to be displayed on said other display part is selected from said sectional images.

6. The display method as set forth in any one of claims 1 - 3, wherein image display conditions of said three images are adjustable at a same level, especially in their contrast and brightness.

7. A display apparatus for displaying three-dimensional data as a combination of three sectional images of an X-section, a Y-section, and a Z-section orthogonalizing each other, by processing a three-dimensional data obtained by such as CT imaging, comprising;

an image memory for saving prepared sectional images of

sections parallel to said X-section, Y-section, and Z-section, said sectional images being sliced off data from said three-dimensional data at a predetermined interval, and

a display controlling means with three display parts for displaying a combination of an X-sectional image, a Y-sectional image, and a Z-sectional image as a three sectional displaying mode, each sectional image being selected from said sectional images previous prepared, together with an X-cursor, a Y-cursor, and a Z-cursor, each of which specifies a section of said corresponding sectional images,

whereby when, on any one of said three display parts, at least one of said cursors displayed together with said sectional images is moved, a sectional image to be displayed corresponding to the moved cursor on another display part different from the display part where the cursor was moved is sequentially changed, following the moving of the cursor, in a manner that said sectional image to be displayed on said other display part is selected from said sectional images.

8. The display apparatus as set forth in claim 7, further comprising a rotating means for coordinate axis;

wherein, a uvw coordination system defined by U-section, V-section and W-section is newly defined as a rotated coordination system by said rotating means relative to a xyz coordination system defined by said X-section, said Y-section and said Z-section,

wherein said image memory saves in advance prepared sectional images of sections parallel to said U-section, V-section, and

W-section, said sectional images being sliced off data from said three-dimensional data at a predetermined interval,

wherein by said display controlling means on said three display parts a combination of an U-sectional image, a V-sectional image, and a W-sectional image are displayed as a three sectional displaying mode, each sectional image being selected from said sectional images previous prepared, together with an U-cursor, a V-cursor, and a W-cursor, each of which specifies a section of said corresponding sectional images,

and whereby when, on any one of said three display parts, at least one of said cursors displayed together with said sectional images is moved, a sectional image to be displayed corresponding to the moved cursor on another display part different from the display part where the cursor was moved is sequentially changed, following the moving of the cursor, in a manner that said sectional image to be displayed on said other display part is selected from said sectional images.

9. The display apparatus as set forth in claim 8,

wherein presetting of a rotational angle for said uvw coordinate system is executed by doing a specified operation on any one of display parts displaying the X-, Y-, and Z-sectional images.

10. The display apparatus as set forth in any one of claims 7 - 9,

wherein said three sectional images are displayed as combination of three-section images, like as a form of

three-section picture display of a three-dimensional body.

11. The display apparatus as set forth in any one of claims 7 - 9,

wherein said cursors are displayed on said three display parts as a combination of two cursors crossing each other,

and wherein, when a crossing point of said two cursors is transversely moved on any one of said display parts, sequentially changing sectional images to be displayed corresponding to said moved cursors by moving of the crossing point on other display parts different from the display part where the cursor was moved, following the moving of the cursors, in a manner that said sectional image to be displayed on said other display part is selected from said sectional images.

12. The display apparatus as set forth in any one of claims 7 - 9,

wherein image display conditions of said three images are adjustable at a same level, especially in their contrast and brightness.

13. A recording medium in which a computer readable program is saved for executing the method for displaying three-dimensional data as a combination of three sectional images of an X-section, a Y-section, and a Z-section orthogonalizing each other, by processing a three-dimensional data obtained by such as CT imaging, said method comprising the steps of;

preparing in advance sectional images of sections parallel

to said X-section, Y-section, and Z-section, said sectional images being sliced off data from said three-dimensional data at a predetermined interval,

displaying on three display parts as a three sectional displaying mode a X-sectional image, a Y-sectional image, and a Z-sectional image, each selected from said prepared sectional images, together with an X-cursor, a Y-cursor, and a Z-cursor, each of which specifies a section of said corresponding sectional images, and

when, on any one of said three display parts, at least one of said cursors displayed together with said sectional images is moved, sequentially changing a sectional image to be displayed corresponding to the moved cursor on another display part different from the display part where the cursor was moved, following the moving of the cursor, in a manner that said sectional image to be displayed on said other display part is selected from said sectional images.

14. The recording medium as set forth in claim 13,

wherein, a uvw coordination system defined by U-section, V-section and W-section is newly defined as a rotated coordination system relative to a xyz coordination system defined by said X-section, said Y-section and said Z-section,

and wherein said method comprising the steps of;
preparing in advance sectional images of sections parallel to said U-section, V-section, and W-section, said sectional images being sliced off data from said three-dimensional data at a predetermined interval,

displaying on three display parts as a three sectional displaying mode a U-sectional image, a V-sectional image, and a W-sectional image, each selected from said prepared sectional images, together with an U-cursor, a V-cursor, and a W-cursor, each of which specifies a section of said corresponding sectional images, and

when, on any one of said three display parts, at least one of said cursors displayed together with said sectional images is moved, sequentially changing a sectional image to be displayed corresponding to the moved cursor on another display part different from the display part where the cursor was moved, following the moving of the cursor, in a manner that said sectional image to be displayed on said other display part is selected from said sectional images.

15. The recording medium as set forth in claim 14,

wherein presetting of a rotational angle for said uvw coordinate system is executed by doing a specified operation on any one of display parts displaying the X-, Y-, and Z-sectional images.

16. The recording medium as set forth in any one of claims 13 - 15, wherein said three sectional images are displayed as combination of three-section images, like as a form of three-section picture display of a three-dimensional body.

17. The recording medium as set forth in any one of claims 13 - 15,

wherein said cursors are displayed on said three display parts as a combination of two cursors crossing each other,

and wherein, when a crossing point of said two cursors is transversely moved on any one of said display parts, sequentially changing sectional images to be displayed corresponding to said moved cursors by moving of the crossing point on other display parts different from the display part where the cursor was moved, following the moving of the cursors, in a manner that said sectional image to be displayed on said other display part is selected from said sectional images.

18. The recording medium as set forth in any one of claims 13 - 15, wherein image display conditions of said three images are adjustable at a same level, especially in their contrast and brightness.

19. A display method for displaying three-dimensional data as a combination of three sectional images of an X-section, a Y-section, and a Z-section orthogonalizing each other, by processing a three-dimensional data obtained by such as CT imaging, said method characterized by

preparing in advance sectional images of sections parallel to said X-section, Y-section, and Z-section, said sectional images being sliced off data from said three-dimensional data at a predetermined interval, and

displaying as a list displaying mode a series of sectional images selected from said X-sectional images, Y-sectional images and Z-sectional images previously prepared.

20. The display method as set forth in any one of claims 1 - 3,

wherein, by a specific operation, said three sectional displaying mode is changed into a list displaying mode displaying a series of sectional images selected from said X-sectional images, Y-sectional images and Z-sectional images previously prepared,

and in this state of said list displaying mode, when any sectional image is selected, by a specific operation, said list displaying mode is changed into said three sectional displaying mode displaying three sectional images including the selected sectional image.

21. A display apparatus for displaying three-dimensional data as a combination of three sectional images of an X-section, a Y-section, and a Z-section orthogonalizing each other, by processing a three-dimensional data obtained by such as CT imaging, comprising;

an image memory for saving prepared sectional images of sections parallel to said X-section, Y-section, and Z-section, said sectional images being sliced off data from said three-dimensional data at a predetermined interval, and

display controlling means with three display part for displaying as a list displaying mode a series of sectional images selected from said X-sectional images, Y-sectional images and Z-sectional images previously prepared.

22. The display apparatus as set forth in any one of claims 7 - 9,

wherein, by a specific operation, said three sectional displaying mode is changed into a list displaying mode displaying a series of sectional images selected from said X-sectional images, Y-sectional images and Z-sectional images previously prepared,

and in this state of said list displaying mode, when any sectional image is selected, by a specific operation, said list displaying mode is changed into said three sectional displaying mode displaying three sectional images including the selected sectional image.

23. A recording medium in which a computer readable program is saved for executing the method for displaying three-dimensional data as a combination of three sectional images of an X-section, a Y-section, and a Z-section orthogonalizing each other, by processing a three-dimensional data obtained by such as CT imaging, characterized by

preparing in advance sectional images of sections parallel to said X-section, Y-section, and Z-section, said sectional images being sliced off data from said three-dimensional data at a predetermined interval, and

displaying as a list displaying mode a series of sectional images selected from said X-sectional images, Y-sectional images and Z-sectional images previously prepared.

24. The recording medium as set forth in any one of claims 13

- 15,

wherein, by a specific operation, said three sectional displaying mode is changed into a list displaying mode displaying a series of sectional images selected from said X-sectional images, Y-sectional images and Z-sectional images previously prepared,

and in this state of said list displaying mode, when any sectional image is selected, by a specific operation, said list displaying mode is changed into said three sectional displaying mode displaying three sectional images including the selected sectional image.

25. The display method as set forth in any one of claims 1 - 3,

wherein the corresponding cursor displayed on the other display part different from the display part where said moved cursor is displayed, is also correspondingly moved following the movement of said moved cursor.

26. The display apparatus as set forth in any one of claims 7 - 9,

wherein the corresponding cursor displayed on the other display part different from the display part where said moved cursor is displayed, is also correspondingly moved following the movement of said moved cursor.

27. The recording medium as set forth in any one of claims 13 - 15,

wherein the corresponding cursor displayed on the other display part different from the display part where said moved cursor is displayed, is also correspondingly moved following the movement of said moved cursor.

28. A computer readable program for executing a display method for displaying three-dimensional data as a combination of three sectional images of an X-section, a Y-section, and a Z-section orthogonalizing each other, by processing a three-dimensional data obtained by such as CT imaging, said method comprising the steps of;

preparing in advance sectional images of sections parallel to said X-section, Y-section, and Z-section, said sectional images being sliced off data from said three-dimensional data at a predetermined interval,

displaying on three display parts as a three sectional displaying mode a X-sectional image, a Y-sectional image, and a Z-sectional image, each selected from said prepared sectional images, together with an X-cursor, a Y-cursor, and a Z-cursor, each of which specifies a section of said corresponding sectional images, and

when, on any one of said three display parts, at least one of said cursors displayed together with said sectional images is moved, sequentially changing a sectional image to be displayed corresponding to the moved cursor on another display part different from the display part where the cursor was moved, following the moving of the cursor, in a manner that said sectional image to be displayed on said other display part is

selected from said sectional images.

29. The computer readable program as set forth in claim 28, wherein, a uvw coordination system defined by U-section, V-section and W-section is newly defined as a rotated coordination system relative to a xyz coordination system defined by said X-section, said Y-section and said Z-section, and wherein said method comprising the steps of; preparing in advance sectional images of sections parallel to said U-section, V-section, and W-section, said sectional images being sliced off data from said three-dimensional data at a predetermined interval, displaying on three display parts as a three sectional displaying mode a U-sectional image, a V-sectional image, and a W-sectional image, each selected from said prepared sectional images, together with an U-cursor, a V-cursor, and a W-cursor, each of which specifies a section of said corresponding sectional images, and when, on any one of said three display parts, at least one of said cursors displayed together with said sectional images is moved, sequentially changing a sectional image to be displayed corresponding to the moved cursor on another display part different from the display part where the cursor was moved, following the moving of the cursor, in a manner that said sectional image to be displayed on said other display part is selected from said sectional images.

30. The computer readable program as set forth in claim 29,

wherein presetting of a rotational angle for said uvw coordinate system is executed by doing a specified operation on any one of display parts displaying the X-, Y-, and Z-sectional images.

31. The computer readable program as set forth in any one of claims 28 - 30,

wherein said three sectional images are displayed as combination of three-section images, like as a form of three-section picture display of a three-dimensional body.

32. The computer readable program as set forth in any one of claims 28 - 30,

wherein said cursors are displayed on said three display parts as a combination of two cursors crossing each other,

and wherein, when a crossing point of said two cursors is transversely moved on any one of said display parts, sequentially changing sectional images to be displayed corresponding to said moved cursors by moving of the crossing point on other display parts different from the display part where the cursor was moved, following the moving of the cursors, in a manner that said sectional image to be displayed on said other display part is selected from said sectional images.

33. The computer readable program as set forth in any one of claims 28 - 30, wherein image display conditions of said three images are adjustable at a same level, especially in their contrast and brightness.

34. A computer readable program for executing a display method for displaying three-dimensional data as a combination of three sectional images of an X-section, a Y-section, and a Z-section orthogonalizing each other, by processing a three-dimensional data obtained by such as CT imaging, characterized by

preparing in advance sectional images of sections parallel to said X-section, Y-section, and Z-section, said sectional images being sliced off data from said three-dimensional data at a predetermined interval, and

displaying as a list displaying mode a series of sectional images selected from said X-sectional images, Y-sectional images and Z-sectional images previously prepared.

35. The computer readable program as set forth in any one of claims 28 - 30,

wherein, by a specific operation, said three sectional displaying mode is changed into a list displaying mode displaying a series of sectional images selected from said X-sectional images, Y-sectional images and Z-sectional images previously prepared,

and in this state of said list displaying mode, when any sectional image is selected, by a specific operation, said list displaying mode is changed into said three sectional displaying mode displaying three sectional images including the selected sectional image.

36. The computer readable program as set forth in any one of claims

28 - 30,

wherein the corresponding cursor displayed on the other display part different from the display part where said moved cursor is displayed, is also correspondingly moved following the movement of said moved cursor.

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